

PubMed

U.S. National Library of Medicine
National Institutes of Health



Display Settings: Abstract

[Brain Pathol.](#) 2011 May 26. doi: 10.1111/j.1750-3639.2011.00505.x. [Epub ahead of print]

Complex oncogenic signaling networks regulate brain tumor-initiating cells and their progenies: Pivotal roles of wild-type EGFR, EGFRvIII mutant and hedgehog cascades and novel multitargeted therapies.

Mimeault M, Batra SK.

Department of Biochemistry and Molecular Biology, College of Medicine, University of Nebraska Medical Center, Omaha, NE 68198-5870, U.S.A.

Abstract

Complex signaling cross-talks between different growth factor cascades orchestrate the primary brain cancer development. Among the frequent deregulated oncogenic pathways, the ligand activated wild-type EGFR, constitutively activated EGFRvIII mutant and sonic hedgehog pathways have attracted much attention due to their pivotal roles in pediatric medulloblastomas and adult glioblastoma multiformes (GBMs). The enhanced expression levels and activation of EGFR, EGFRvIII mutant and hedgehog signaling elements can provide key roles for the sustained growth, migration and local invasion of brain tumor-initiating cells (BTICs) and their progenies, resistance to current therapies and disease relapse. These tumorigenic cascades also can cooperate with Wnt/ β -catenin, Notch, platelet-derived growth factor (PDGF)/PDGFR receptors, hepatocyte growth factor (HGF)/c-Met receptor and vascular endothelial growth factor (VEGF)/VEGFR receptors for the acquisition of a more malignant behavior and survival advantages by brain tumor cells during disease progression. Therefore, the simultaneous targeting of these oncogenic signaling components including wild-type EGFR, EGFRvIII mutant and hedgehog pathways may constitute a potential therapeutic approach of great clinical interest to eradicate BTICs and improve the efficacy of current clinical treatments by radiation and/or chemotherapy against aggressive and recurrent medulloblastomas and GBMs.

© 2011 The Authors; Brain Pathology © 2011 International Society of Neuropathology.

PMID: 21615592 [PubMed - as supplied by publisher]

LinkOut - more resources